

Syllabus: Marine Biochemistry (SIO 181)

Instructors

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Office hours:

By appointment

Time (Lectures):

Tuesday & Thursday 8.00 - 9.20 am

Location (Lectures):

PETER 104

Time (Seminars)

Monday 4-5 pm ; Wednesday 5-6 pm

Location (Seminars)

Vaughn Hall 100

Final Exam:

TBD

Required textbooks:

None, instructors will upload reference material (TED)

Course Goals:

To provide an introduction of biochemical and physiological adaptations in diverse marine organisms and how these adaptations are important in their natural environment and in relation to anthropogenic activities.

Learning Objectives:

By the conclusion of the course, the students should be familiarized with biochemical and physiological adaptations used by marine organisms. In particular, they should have learned principles on essential physiological processes such as:

- Metabolism (aerobic and anaerobic),
- Biom mineralization (calcium carbonate, silica, etc)
- Symbiosis (in corals, mollusks, worms)
- pH regulation (all organisms)
- osmoregulation (osmoconformers, osmoregulators).

The students should also become familiar with the most important biochemical and physiological adaptations that are characteristic for diatoms, corals, oysters, deep-sea worms, sea urchins, hagfish, lampreys, sharks and bony fish.

Course Website:

Course materials will be available through the course website

(<http://ted.ucsd.edu>). All students will need to be able to access this site. Be sure to check the course website frequently for announcements, updates and

assignments.

Grading:

Grades will be based on a “Midterm Exam” on lectures 1-12 (40% of the final grade), a “Final Exam” focused on lectures 13-19 (40% of the final grade), and “Seminars” (20% of final grade).

Schedule

Tue March 29	Intro
Thu March 31	Metabolism
Tue April 5	Anaerobiosis <i>Guest lecturer Dr. Felbeck</i>
Thu April 7	Hypoxia Adaptations
Tue April 12	Acid/Base regulation I <i>ATPases, Carbonic Anhydrases</i>
Thu April 14	Acid/Base regulation II <i>Environmental Disturbances</i>
Tue April 19	Thermal Strategies in the Marine Environment <i>Guest lecturer Dr. Wegner</i>
Thu April 21	Symbiosis <i>Guest lecturer Dr. Felbeck</i>
Tue April 26	Physiology of Bone-eating <i>Osedax</i> worms <i>Acid secretion, symbiosis and Acid/Base regulation</i>
Thu April 28	Pharmacognosy & biomimicry <i>Guest lecturer Dr. Rapoport</i>
Tue May 3	MIDTERM
Thu May 5	Corals I <i>Anatomy, Morphology, Cytology, Symbiosis</i>
Tue May 10	Corals II <i>Calcification, pH regulation, nitrogen metabolism, in vitro research approaches, bleaching</i>
Thu May 12	Biom mineralization <i>Intro</i>
Tue May 17	Diving Physiology <i>Guest lecturer Mr. Michael Tift</i>
Thu May 19	Physiology of Hagfish I <i>Acid/Base regulation, feeding strategies</i>
Tue May 24	Physiology of Hagfish II <i>Slime production</i>
Thu May 26	Biom mineralization <i>Silica, Calcium Carbonate, Bone</i>
Tue May 31	Osmoregulation <i>Hagfish, Sharks and Bony Fish</i>
Thu June 2	Review Session
Tue June 7	FINAL

Note: 80-minute lectures

Quarter begins Thursday March 24, ends Friday June 10.

Final Exams: June 4-10